Remarks:

Applicants appreciatively acknowledge the Examiner's confirmation of receipt of Applicants' claim for priority and certified priority document under 35 U.S.C. § 119(a)-(d).

Reconsideration of the application is respectfully requested.

Claims 1 - 14 are presently pending in the application. Claims 1 and 8 have been amended. Claim 1 has been amended to correct an error that caused that claim to erroneously recite "alignment parameters" in connection with a formula relating to an "overlay" parameter. Support for this amendment can be found on page 13, line 17 - page 14, line 4, of the instant application.

In paragraph 4 of the above-identified Office Action, claims 8 - 14 were rejected as being indefinite under 35 U.S.C. § 112, second paragraph. More specifically, the Office Action stated that in claim 8, the term "two semiconductor wafers" in paragraph 3, lacks antecedent basis. The dependent claims were rejected on the same basis as independent claim 8. Claim 8 has been amended to remove the references made to "two semiconductor wafers" and "first" and "second" semiconductor wafers. Resultantly, claim 8 relates to a method applied to the same (one) wafer. Support can be found for these amendments on page 15, line 21 - page 16, line 10 of the

instant application.   See also, Fig. 2.   It is accordingly

believed that claims 8 - 14 meet the requirements of 35 U.S.C.

§ 112, second paragraph.

In paragraph 6 of the Office Action, claims 1 - 7 were

rejected as allegedly being anticipated under 35 U.S.C. §

102(b) by U. S. Patent No. 5,863,680 to Kawakubo et al.

("**KAWAKUBO**").

Applicants respectfully traverse the above rejection.

I.   **Applicants' invention of claim 1 requires, among other limitations, "calculating values" of a set of parameters representing an overlay accuracy of the first pattern on the first semiconductor wafer using a formula.**

Before discussing the prior art in detail, it is believed that

a brief review of the invention as claimed, would be helpful.

Claim 1 recites, among other limitations,

> "**calculating values** of a set of parameters representing
> an **overlay accuracy** of the first pattern on the first
> semiconductor wafer **using a formula** for each of the
> parameters of the set representing the overlay
> accuracy, **the formula being a function of each of the
> alignment parameters of the first set;**" [emphasis added
> by Applicants]

Applicants' independent claim 8 recites a similar limitation.

Applicants' claimed "**calculating**" step is fully supported in

the specification of the instant application. Page 13, lines

9 - 15, of the instant application state:

> "After the wafer has been exposed, the wafer alignment
> parameter data, which are measured during the alignment
> step 20, are examined in a control unit 100. Thereby,
> using the wafer alignment parameter data, it **calculates**
> the relevant inspection overlay data, i.e. values for
> the set of overlay parameters representing the overlay
> accuracy of the pattern that is structured on the first
> semiconductor wafer 1." [emphasis added by Applicants]

Note that Applicants' claimed formula additionally requires,

among other things, that **the formula is a function of each of**

the alignment parameters of the first set. Using the formula,

or several formulas, a set of parameters representing the

overlay accuracy can be calculated. Each parameter

representing the **overlay accuracy** has its formula which is a

function of each of its alignment parameters. Each formula is

characterized by its own set of coefficients.

Further, that Applicants' claimed invention requires the

calculating step to use a **formula** is additionally supported in

the present application. See the instant application, page

13, line 17 - page 14, line 4.

In Applicants invention of claim 1, the **values** obtained in the

calculating step are further **adjusted**. Applicants' claim 1

further recites, among other limitations:

"**adjusting values** of the second set of alignment
parameters to correct for an overlay inaccuracy of the
first pattern;" [emphasis added by Applicants]

Independent claim 8, additionally contains a corresponding

limitation. The claimed **adjusting** step is another step **in**

addition to Applicants' claimed **calculating** step. This is

further supported in the instant application. Page 7 of the

present specification, lines 16 - 20, state:

"In another aspect of the present invention, both the
parameters reflecting the overlay accuracy **are calculated
using a formula and the second set of alignment parameters
is adjusted**, i.e. the tool-offset alignment parameters,
prior to exposing the semiconductor wafer." [emphasis
added by Applicants]

As can be seen from the present application, claim 1 requires,

among other limitations, the particularly described

calculating step, using a formula, and the particularly

recited **adjusting** step.

II. **The KAWAKUBO reference, cited in the Office Action, fails
to teach among other limitations, Applicants'
particularly claimed "calculating values . . . using a
formula" step of claim 1.**

In contrast to Applicants' claimed invention, which **calculates**

using a formula the **values** of a set of parameters representing

an overlay accuracy of the first pattern, **KAWAKUBO**

specifically teaches obtaining data values from a **database**, in

which they were stored after being **measured** through direct

inspection. More specifically, in **KAWAKUBO**, col. 5, lines 10

- 55, state:

> "Then, a description will be made of the method for
> exposing the wafer 100 to light with reference to the
> flowchart as shown in FIG. 4. The exposure method
> according to the present invention may be carried out
> **on the basis of data stored in two databases** as will be
> described hereinafter, namely, database 1 and database
> 2. **The storage 16 stores, as the database 1, alignment
> residual errors <u>measured</u> by the inspection unit 24
> after exposure and conditions of exposure and alignment
> upon exposure.**
>
> The contents of the database 1 are as follows:
> 1. Names of operation steps;
> 2. Names of exposure apparatuses;
> 3. Names of reticles;
> 4. Names of steps for forming alignment layers;
> 5. Names of exposure apparatuses for exposing the
> alignment layers;
> 6. Names of reticles for exposing the alignment layers;
> 7. Alignment conditions; and
> 8. Alignment residual errors. "   [emphasis added by
> Applicants]

See also, col. 5, lines 31 - 55 of **KAWAKUBO.**

Further, as described above, Applicants' **calculating step**

results in a set of parameters representing **"overlay**

accuracy". This **"overlay accuracy"** is calculated using a

formula and **as a function of each of the alignment parameters.**

KAWAKUBO neither teaches, nor suggests, obtaining Applicants'

claimed set of parameters representing **"overlay accuracy"**

using a formula which is a **function of each of the alignment**

parameters. In **KAWAKUBO,** there cannot be found any indication

of parameters that represent the **"overlay accuracy"**. Thus,

Applicants' claimed **calculating** step is clearly missing from

KAWAKUBO.

In **KAWAKUBO,** after data is read from the databases, then a

calculation is performed. However, this calculation is not

Applicants' claimed **calculating** step, either. First, the

calculations in **KAWAKUBO** do not generate Applicants' claimed

"**overlay accuracy**" using **a formula that is a function** of each

of the alignment parameters. Further, at best, the

calculation in **KAWAKUBO** can be better analogized to

Applicants' claimed adjusting step. For example, col. 6,

lines 16 - 36, state:

> "**The main control unit 14 then sets the following
> parameters on the basis of the data read therein from the
> databases 1 and 2** (step 5).
>
> 1. Name of the operation step;
> 2. Name of the exposure apparatus;
> 3. Name of the reticle for exposure;
> 4. Name of the step for forming the alignment layer;
> 5. Name of the exposure apparatus for exposing the
> alignment layer; and
> 6. Name of the reticle for exposing the alignment layer.
>
> **Thereafter**, the main control unit 14 searches for the past
> alignment conditions and alignment residual errors
> corresponding to the above six parameters **from the
> database** 1 stored in the storage 16 (step 6). In this
> search process, it is not necessary to search for all the
> past data as a search condition and it may be one such as
> n pieces of latest data or data saved in latest n hours
> (or days or months). From a mean value of the data for
> which the search has been made and which has been
> retrieved, the main control unit 14 calculates new
> alignment conditions (correction parameters) for the wafer
> 100 to be exposed from the formula as follows (step 7):

New alignment conditions=corresponding past alignment conditions minus corresponding past alignment residual error.

The new alignment conditions may also be calculated from the coordinates system of a vernier measurement instrument as follows:

New alignment conditions=corresponding past alignment conditions plus corresponding past alignment residual error." [emphasis added by Applicants]

As such, **KAWAKUBO** fails to teach or suggest Applicants' claimed **"overlay accuracy" values** that Applicants' claims **require** to be **calculated using a formula as a function of each alignment parameter.** In **KAWAKUBO** any values that are used for alignment conditions, are: 1) **measured** through inspection; 2) **stored in a database**; and 3) when needed for use, **read out from the database.** The calculated portion of **KAWAKUBO** described above, relates analogously, if to any part of Applicants' claimed invention, to Applicants' claimed **adjusting** step, and **not** to Applicants' claimed **calculating** step.

As such, **KAWAKUBO** neither teaches, nor suggests, Applicants' particularly claimed **calculating** step and **formula.** In fact, **KAWAKUBO** specifically teaches away from Applicants' claimed **calculating** step by requiring data used in **KAWAKUBO** to be directly measured by an inspection unit and stored in a database for later use in an adjusting calculation. Additionally, the data used in **KAWAKUBO** does not correspond to

Applicants' particularly claimed calculated data representing

overlay accuracy.

As such, the **KAWAKUBO** reference fails to teach, or suggest,

the invention of Applicants' independent claims 1 and 8.

Claim 8 further requires, that the alignment setting **of the**

same wafer be adjusted, which is not taught in **KAWAKUBO**.

Claims 1 and 8 are, therefore, believed to be patentable over

the art. The dependent claims are believed to be patentable

as well because they all are ultimately dependent on either

claim 1 or claim 8.

III. Conclusion

In view of the foregoing, reconsideration and allowance of

claims 1 - 14 are solicited.

In the event the Examiner should still find any of the claims

to be unpatentable, counsel would appreciate receiving a

telephone call so that, if possible, patentable language can

be worked out.

If an extension of time for this paper is required, petition

for extension is herewith made.

Please charge any fees that might be due with respect to

Sections 1.16 and 1.17 to the Deposit Account of Lerner and

Greenberg, P.A., No. 12-1099.

Respectfully submitted,   Kerry P. Sisselman
                                           Reg. No. 37,237

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For Applicants

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